Arts v. 1.

PATENT

ARTIFICIAL SLATE

MANUFACTORY,

WOODFORD BRIDGE, ESSEX,

FOR COVERING

ROOFS, FRONTS OF HOUSES, AND RICKS;

ALSO

WATER PIPES AND GUTTERS.

Specimens of the above Articles and Models of the Rick Frames may be ſeen at Mr. HALL's, Surveyor to the City of London, No. 8, Paternoſter Row, near Cheapſide;

At Mr. SEARLES's, Surveyor, Kent Road, in the Borough;

At Mr. EDDIE's, Seedſman, No. 68, in the Strand;

At Mr. BALL's, Stationer, No. 318, Corner of Southampton Buildings, Holborn;

At Mr. HUNTER's, Carver and Guilder, No 44, Piccadilly, oppoſite St. James's Church.

At all the above Places may be had, Pamphlets, 2d. Pence each; Eſtimates, gratis; and where Orders are taken in.

1786

PRELIMINARY OBSERVATIONS.

THE Artificial Slate is ſold at the Manufactory at Woodford Bridge, Eſſex, for ready money only, to be paid for on delivery. — Slate ſold for ready money only.

The proprietor, ſolicitous to make the artificial ſlate as generally and extenſively uſeful as poſſible, and having it now in his power, from ſome favourable circumſtances, to reduce the price, has determined to ſell each ſlate, 24 inches by 12, for one ſhilling, which has heretofore been ſold for fifteen pence. — Reduced price of the artificial ſlate.

Each artificial ſlate meaſures 24 inches by 15; and 42 of them weigh only 1 cwt. 1 q. 17 lb. and cover a ſquare, or 100 ſuperficial feet of roofing. Pantiles for the ſame extent of covering weigh 7 cwt. 1 q. 8 lb. and flat tiles for the ſame extent 12 cwt. 2 q. 9 lb. — Comparative weight of artificial ſlate.

The cement, braſs nails, metallic paint, &c. &c. coſt about ſix ſhillings per ſquare for uſe in England, in the Weſt Indies ſomething more.

A man and a boy will lay three ſquares per day; and any common carpenter, or handy labourer, by carefully attending to the full directions that follow, may eaſily complete the laying.

If the ſlate is deſired to be delivered any where in London, it may be ſent there for the accommodation of purchaſers, or to any of the quays. If the weight exceeds two cwt. it may be conveyed at ſixpence per cwt.; any leſſer quantity at the ſame rate would not ſufficiently pay the perſon who ſhould carry it. Gentlemen may do as they pleaſe, and ſend for it themſelves.

ABSTRACT FROM THE ESTIMATES.

Small coſt of the artificial ſlate.

A Houſe at Streatham, in Surry, late Lord Harrowby's, 50 feet 6 inches by 41 feet 3 inches on the ground plan, the roof of which completed with lead gutters, and to be covered with common blue ſlating, was eſtimated by an experienced ſurveyor * at 192l. 7s. 4d. is now compleated with the artificial ſlate, and amounts only to 90l. 8s. 6d.—See particulars in the eſtimates, No. 1 *, and No. 1 **.

A houſe on Dartmouth Hill at Lewiſham, in Kent, was eſtimated at 99l. 4s. 8¾d. if covered with flat titles; but as now completed with the artificial ſlate, amounts only to 48l. 18s. 8½d. —See the particulars in the eſtimates, No. 6, and No. 6 *.

A variety of other examples of different ſized roofs covered with the artificial ſlate, are to be ſeen in theſe eſtimates; all which prove it to be on an average from 50 to 100 per cent. cheaper than flat titles, or blue ſlating.

Hay ricks

The preſent very exorbitant price of ſtraw of 40s. per load induced the proprietor, who has a very extenſive concern of many hundred loads of hay to make annually, to form pendant frames covered with the artificial ſlate, as a ſubſtitute for thatching, and he has the ſatisfaction to find they anſwer perfectly well; they are productive of many advantages from which ſtraw thatching is precluded, beſides the very prevailing one, of proving, within the courſe of a few years, many hundreds per cent. cheaper than ſtraw.

Theſe frames will cover the largeſt ricks in the ſpace of a couple of hours, and thereby often prove the ſaving a whole rick from damage in ſudden ſhowery and precarious weather.

They will effectually ſerve as temporary coverings for new ricks whilſt making, in lieu of ſail cloths, and completely pre-

* Mr. Searles.

vent

vent the rain from penetrating into new-made hay, which is ſeldom the caſe of ſail cloths in violent rains; beſides theſe inſufficient coverings are often much damaged by the heat of the ricks, when they ought always to be preſerved for covering the loads of hay that go to market.

But the artificial ſlate frames are ſo contrived with ſmall wedges fixed between each ſlate, that the heat and ſteam from new-made ricks compleatly paſſes off, and runs down the covering with the greateſt eaſe: this is no inconſiderable advantage to new-made ricks, eſpecially in rainy weather, for by theſe frames the water is prevented from entering them, and the heat and vapour at the ſame time are freely diſcharged.

Beſides, the part of the frames from which the haybinder cuts his hay for market may with great eaſe be ſupported with a ſmall roll, by which both the hay and himſelf may remain in the dry in rainy weather.

There is another advantage from theſe artificial ſlate frames worthy of notice; the ricks they cover have all the advantage of the air and weight of the atmoſphere, both of which are neceſſary to effect a complete ſettlement of the hay, but which is never the caſe with the hay in Dutch barns, and therefore a ſtrong objection to them has always been made by the intelligent farmer, who well knows the hay under them never becomes compact and firm, like that which is cut from a rick in the open air, and which is conſtantly hard and cloſely preſſed together.

Pipes

The artificial ſlate pipes and gutters for the conveyance of water are above 150 per cent. cheaper than leaden ones of the ſame diameter, being ſold for twenty-two pence per foot, whereas thoſe of lead are ſold at five ſhillings per foot. It is preſumed alſo from ſeveral years trial of them, that they will laſt as long as thoſe of lead, not being liable to crack in the leaſt, or to loſe their ſhape. Beſides, near large towns there will be no temptation to ſteal them, as is but too frequently the caſe with lead pipes.

N. B. It is earneſtly intreated to unpack the artificial ſlate as ſoon as it comes from on board the ſhip, to ſeparate the ſlates, and

let them remain upright on their longeſt edge to harden a little before they are uſed. This will be of great ſervice, and cauſe them to petrify much ſooner with the metallic paint and prepared ſand.

It may be ſufficient to have premiſed this. More complete information will be given in the courſe of this book.

PATENT

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ARTIFICIAL SLATE MANUFACTURE
FOR
ROOFS AND FRONTS OF BUILDINGS,
AND
THATCHING OF RICKS;
ALSO FOR
PIPES AND GUTTERS FOR THE CONVEYANCE OF WATER,

Particularly and reſpectfully recommended

TO THE

WEST-INDIA GENTLEMEN.

THE Artificial Slate, for cheapneſs, lightneſs, beauty, and neatneſs, is allowed to equal, if not to excel moſt other coverings; and if due attention is paid to the printed inſtructions, (eſpecially in laying it properly at firſt) it is preſumed it will prove equal to them in durability alſo.—See the affidavit and teſtimonies at the end of this book.

Leſs timber, lead, and brick-work, required with the artificial ſlate.

It appears beyond a doubt, by all the comparative eſtimates herewith publiſhed of different ſized houſes covered with the Artificial Slate within ten miles of London, that their roofs come cheaper from 50 to 100 per cent. than they would if covered with common flat tiles, or blue ſlating: and theſe great ſavings (as is clear from the ſaid eſtimates) proceed from employing a much leſs quantity of timber, lead, and brick-work, than when the roofs are covered with tiles, or blue ſlating.—See the printed eſtimates.

Durability of the artificial ſlate.

The perfect ſtate in which all the roofs of the Manufactory have continued for eight years laſt paſt, though without the leaſt repair, except a ſlight coat of metallic paint every fourth year, is

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one ſtriking proof of its great excellence, though many others will be given hereafter. It muſt be obſerved alſo, that though the roofs have been thus trivially repaired, the fronts have not at all, but have continued perfect the whole time without any additional painting till this year.

Its reſiſtance to fire, lightning, &c.

Its being proof, in ſo powerful a degree, againſt fire, lightning, wind, water, froſt and ſnow, and a remedy beſides againſt the *dry rot*, when placed behind wainſcots, or laid under floors, and the great probability of its anſwering the purpoſe of fire-plates, (not being like them ſubject to ruſt) are ſufficient evidences of its uncommon merit, and place it above moſt other materials. It is hoped therefore, that every unprejudiced individual, who means to build with œconomy, will be induced to uſe it, and candidly, though ſtrictly, examine its real properties, and recommend it (if deſerving) to as general uſe in *Great Britain*, as it has experienced for ſeveral years in the *Weſt Indies*.

Artificial ſlate cannot be uſed in London.

It muſt be obſerved, that the artificial ſlate, though it poſſeſſes ſo many valuable qualities and advantages, yet cannot be uſed in *London*, having been invented ſince the act of Parliament paſſed, called *The Builder's Act*, in which all materials whatever, that can be uſed in London, are particularly named. Of courſe the artificial ſlate is excluded; except nevertheleſs that it may be employed in all iſolated ſituations, on low ſheds as high as the firſt floor, ſhop windows, or in areas, where wood and any materials are permitted.—The proprietor thinks it his duty to mention this circumſtance as a caution, becauſe ſome gentlemen have inadvertently uſed it in London, and ſome have been obliged, by the ſeverity of the diſtrict ſurveyors, to take it off their roofs.

Great demand for the artificial ſlate.

This is the eighth year ſince the artificial ſlate has been eſtabliſhed in Eſſex; yet the demand for it has been ſo great and conſtant in the Weſt Indies, that the proprietor has never been able till now (and ſince he has erected a double ſet of works) to get a ſufficient ſtock before hand to advertiſe it for public ſale in England: but gentlemen and artiſts may now be ſupplied with any quantity at the ſhorteſt notice for home or foreign conſumption.

He begs leave alſo to inform the Weſt-India merchants (in order to make it known to their correſpondents abroad) that he has received intelligence from one of his friends at St. Kitt's, that, in ſome few inſtances, the artificial ſlate in that iſland, by the negligence of the workmen employed, has been laid with too ſmall a lap, contrary to the printed inſtructions. This has been productive of ſome inconvenience, by the neceſſity of relaying it to its proper lap, which has always effectually anſwered. This certainly is no defect in the material itſelf; yet the proprietor, ever anxious to ſhew his acknowledgements to his benefactors in the Weſt India trade, chearfully offers to ſupply any of them *gratis* with whatever artificial ſlate may be deficient, where the relaying it becomes prudent; begging at the ſame time they will in future

oblige

oblige their workmen ſtrictly to follow the printed inſtructions. He flatters himſelf alſo the greateſt care will be obſerved in taking off any of the artificial ſlates that have been ill laid, that the leaſt poſſible waſte may happen.

Method of taking off the artificial ſlate.

The beſt method to detach them from a roof, is firſt to looſe the cement of the joints all round each ſlate with a ſharp carpenter's chiſſel, which will act as a lever; then gently raiſe each nail with the ſame tool, which may eaſily be done with a little attention, and the ſlate ſcarcely ever cracked. When they are relayed, nail them on again in the ſame holes where the lap will admit of it, putting firſt a little ſtiff cement into each hole, and let every other nail be an iron one, with a head to it; then paint and cement over the heads as uſual, and finiſh as the printed directions require.

Bearded nails.

In ſome remarkable hot aſpects in the Weſt Indies, the ſun, in ſome few places of a roof, has drawn the nails. But to obviate this in future, half of the nails ſent out will be bearded, of which every other one muſt be driven into the ſlate. This will render the covering completely firm.

It may not be improper, before the merits of the artificial ſlate, and the inſtructions concerning it, are more fully entered upon, to inform the gentlemen concerned in Weſt India property, of the uncommon advantage it has in point of freight over any other materials that can be ſent for the ſame purpoſe to our ſugar colonies.

Advantage of freight in the artificial ſlate.

Every 1000 of pantiles (the commodity chiefly ſent out) coſts 30 to 40 ſhillings freightage; beſides, near one half of theſe, (or ſuppoſe only one third) on an average, is broken, as every gentleman knows, before they are placed on a building in the Weſt Indies, eſpecially too if they are ſubject to land carriage at any diſtance from the ſea port where they arrive, of courſe 6 or 700 pantiles only coſt the whole freightage, and 35 or 40 per cent. beſides is loſt on the capital employed in the firſt purchaſe of them.

Sixty-three artificial ſlates pack in the ſpace of 25 pantiles.

Sixty-there artificial ſlates may be ſtowed in the ſame ſpace that is required for 25 pantiles of the general ſize, which take up one foot in heighth, two in breath, and one foot four inches in depth. But the 25 pantiles will cover little more than a ſpace of ſix artificial ſlates, or about 15 or 16 ſuperficial feet; whereas the 63 artificial ſlates will cover 160 ſuperficial feet.

1000 pantiles cover only 400 feet, but the artificial ſlate 4608.

It is to obſerved alſo, that 1000 pantiles will take up more than the ſpace of 12 packing caſes, and will cover only 400 ſuperficial feet; whereas 1800 artificial ſlates will pack up in the ſame ſpace, and cover 4608 feet.

No waſte in the artificial ſlate.

One thouſand pantiles will cover only ſix ſquare, and take up 47 cube feet of ſtowage, or freight; whereas 1800 artificial ſlates (as has juſt been obſerved) may be ſtowed in the ſame place, but with this very material difference, that there will not be the leaſt waſte;

waſte; and they will cover 46 ſquare, that is 4608 ſuperficial feet, which is near eight times the ſpace the pantiles will cover.

This great advantage muſt ſtrike every gentleman with ſurpriſe, eſpecially as it proves alſo, that (ſuppoſing only one third of the pantiles are broke) the remainder of the 1000 will cover only 400 feet; whereas the 1800 artificial ſlates, being ſubject to no waſte, will cover their full complement of 4608 feet, which is near twelve times the ſpace of the pantiles.

Difference of weight in the pantiles and the ſlate.

One ſquare of pantiles weighs 700 cwt. 1 q. 8 lb.; the ſame quantity of artificial ſlate only 1 cwt. 1 q. 17 lb.; of courſe near ſix times leſs ſtrength of timber per ſquare is required to ſupport the latter; and from this article of œconomy proceeds one of the chief advantages of the artificial ſlate, although it has many others. —See the ſeparate articles in the roofs of Lord Harrowby's houſe, No. 1 and 1 *, and Colonel Gwyn's, No. 6 and 6 *, and others.

No diſadvantage from cutting the artificial ſlate.

Notice has been already taken of the advantage ariſing to the artificial ſlate from its not being ſubject to any waſte, and the ſuperior convenience of its carriage by ſea or land. It remains to be added, that it is not only very eaſy to be cut to any particular form, if neceſſary, but almoſt the ſmalleſt ſtrip will be found uſeful in a variety of inſtances where lead muſt otherwiſe be uſed; as on pediments of doors, flaſhings for windows, window ſills, ſhop window projections, &c. &c. which is not the caſe of pantiles, nor any other covering —See the windows and doors at the manufactory, which, though very numerous, have not a ſingle piece of lead employed about them.

Great waſte in flat tiles.

In uſing the artificial ſlate in preference to flat or plain tiles, the advantage is ſtill greater; for 4000 flat tiles (which are equal to 1000 pantiles, and much heavier) will take up the ſpace of twelve packing caſes, cover only 588 ſuperficial feet, and require 87 cubic feet of ſtowage; whereas 1800 artificial ſlates, being ſtowed in the ſame ſpace, will cover, as has been obſerved, without waſte, its full complement of 4608 feet, or 46 ſquare, which is eight times the ſpace of covering; and ſuppoſing only one third of the flat tiles are broke, the artificial ſlate will then cover near eleven times the ſpace.

Great weight of flat tiles.

The flat tiles will alſo weigh 1200 cwt. 2 q. 9 lb. but the artificial ſlates only 100 cwt. 1 q. 7 lb.: of courſe eleven times leſs ſtrength of timber per ſquare is required to ſupport them.

Packing caſes.

The packing caſes of the artificial ſlate for the Weſt Indies are ſo calculated, that, when broke up, their wood will make headings for hogſheads, or make a very proper boarding for the roofs of the ſlate, being three quarters of an inch thick: they may ſerve alſo for other purpoſes in building, by which a conſiderable expence is ſaved. The caſes are,

	Feet.	Inches.
In length - -	2	7 ¼
In breadth - - -	2	1
In depth - - -	1	4

Each

Each caſe will contain 150 ſlates, which are equal to 380 feet of covering, though ſtowed in ſo ſmall a ſpace, which muſt be very advantageous to every one who exports this kind of material to any diſtant part of the world; but only 25 pantiles can be ſtowed in the ſame ſpace. Difference of packing in the artificial ſlate and pantiles.

Since the publication of the firſt edition of this treatiſe, the proprietor has conſulted ſeveral gentlemen in the Weſt-India trade relative to the moſt œconomical and deſirable manner of packing the artificial ſlate. Both the following methods have been approved of: in rum puncheons with oats, or in cloſe caſes. The rum puncheons muſt be ſeaſoned ones, and their circular cavities filled up with oats, when the artificial ſlate is packed. Thoſe gentlemen who wiſh to have this method of packing obſerved, will be pleaſed to expreſs it in their orders. Method of packing the artificial ſlate.

Each rum puncheon will contain in its center 150 artificial ſlates, and about eight buſhels of oats in the ſide cavities. As the proprietor lives chiefly in the country, and near the corn farms of Eſſex and Herts, gentlemen may always depend upon the beſt country oats at prime coſt, and on no account will the proprietor ſend out ſhip oats. Gentlemen may provide their own oats if they pleaſe. What the puncheons will contain.

If any improvement or alteration relative to this undertaking ſhould occur to any gentleman, it will be eſteemed a particular favour if he will communicate it to the proprietor.

In conſequence of ſome advices ſent lately from the Weſt Indies, the braſs nails are now made longer and more ſtrong; and every other uſeful improvement will be adopted as ſoon as it comes to the proprietor's knowledge.

Several gentlemen too in the Weſt Indies, as well as in England, have expreſſed their inclinations to ſee publiſhed the particulars of ſome of the eſtimates of the roofs noted in the manufactory book, where a great variety of different roofs, executed within ten miles of London, are collected together for the benefit of purchaſers and others to reſort to and copy. The proprietor therefore thinks it his duty chearfully to comply with their requeſts. From theſe eſtimates it is not only evident that there is a ſurprizing great œconomy ariſing from the uſe of the artificial ſlate, but they ſhew clearly from whence it ariſes. The particular ſcantlings, timber, and all other articles required in different roofs, are likewiſe fully ſet forth and calculated. A great advantage too will be gained from hence by the workmen (even the leaſt experienced in the Weſt Indies) for their better laying the artificial ſlate and forming the roofs, and by all thoſe who cannot have recourſe to the manufactory book itſelf. Eſtimates to be printed.

The artificial ſlate, it is hoped, has now paſſed every danger ariſing to it from envy and faſehood. Indeed, under the late patentee in Norfolk, it might merit ſome cenſure; it was not then brought to perfection, and was ſometimes ill-manufactured: but

 ſince

ſince it has been under the direction of the preſent patentee in Eſſex, it has not been charged with a ſingle fault. Every candid perſon muſt allow, that the early ſtages of any invention cannot be perfect; it muſt have the benefit of time, till induſtry and experience have excluded every error.

Artificial ſlate uſeful for fronts, domes, &c.

The artificial ſlate has been found both uſeful and beautiful for covering the fronts of old wooden, lath and plaſter houſes, for churches, domes, barns, ricks, mills, &c. by which they will appear at a ſmall diſtance as if faced with the fineſt free-ſtone. Specimens of this may be ſeen at the manufactory, and at Mr. Wolf's houſe at Saffron Walden, Eſſex; alſo on the roofs of Meſſrs. Walls great manufactory, and other offices in the City New Road between Iſlington and Old Street, and at Gregory Bateman's, Eſq. at Kentiſh Town houſe, Middleſex.—*Vide* his letter at the end of this book.

Cieling neceſſary to the artificial ſlate.

In all buildings where the artificial ſlate is uſed on roofs, it is abſolutely neceſſary to put ſome ſort of cieling, though ever ſo common; and particular care muſt be taken to have a tolerable thick one in brew-houſes, ſculleries, waſhing-houſes, curing-houſes in the Weſt Indies, and wherever ſteam ariſes, to defend the artificial ſlate, eſpecially when green and raw, from the bad effects of vapour, which is of ſo penetrating a nature that it will cauſe the drieſt and even the thickeſt boarding to warp and ſwell; of courſe it will inevitably prevent the artificial ſlate from petrifying, cauſe it to riſe in parts, and entirely ruin its texture, before it has time to harden.

Artificial ſlate to be laid in Summer or Spring.

It is earneſtly requeſted on no account to lay the artificial ſlate on roofs in winter, or froſty weather; for this too will not only prevent it from hardening, but will hinder the metallic paint from drying, and totally preclude that bond of union which ought duly to take place between the artificial ſlate and the metallic paint; therefore the proper ſeaſons to lay it are Spring and Summer, obſerving before the firſt Winter comes on if the cement in the joints wants repair.

Artificial ſlate proof againſt wind, rain, and ſnow.

From the flatneſs and cloſeneſs with which the artificial ſlate lies on roofs, no driving winds, rain, or ſnow, have ever affected it. Some very extraordinary proofs of this, which happened in the well-known ſtorm of January, 1771, may be fully authenticated by applying to the agent at the manufactory. A very material circumſtance this, which cannot but be of eſſential advantage to all our Weſt-India buildings, where the greateſt depredations are often made by the violence of ſtormy weather, on every kind of erection covered with ſhingles: nor is it an inconſiderable advantage to the Eaſt and Weſt-India buildings, that the artificial ſlate (as has been found from many experiments) is proof againſt lightening—all electrical trials clearly ſhewing it to be a conductor.

Againſt lightning.

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The artificial ſlate has been found very uſeful for roofing and fronting wind and other mills, its elaſtic nature being better calculated than any other material for reſiſting the conſtant friction of mill-work, as may be particularly obſerved at the manufactory, where there are no leſs than five mills, ſome of them very large and powerful, for the uſe of different branches of the manufacture. Theſe have been in work for eight years, and not the leaſt fracture is to be ſeen in any of the roofs or fronts; a circumſtance very favourable to our ſugar colonies, where mills are ſo much uſed. Its uſe in mills.

A fire of very great magnitude may be made on a roof covered with artificial ſlate; and though it may reduce the ſlate by immenſe heat to a calx, yet lead has been proved to melt with a leſs heat, when the artificial ſlate has been but immaterially affected. —See Mr. Dunning's affidavit. Reſiſtance of fire.

Not long ſince a moſt extraordinary proof of the reſiſtance of the artificial ſlate to fire happened at a great manufactory near London, where the chief roof, a very large one, and all the other adjoining offices, were covered with it about eight years ago. One of the buildings, which ſerved for the purpoſe of boiling oil, within a few yards of the principal part of the manufactory, by the over boiling of this inflammable article, was filled with the moſt ardent flames; nevertheleſs the artificial ſlate (though it had no cieling under it, but lay upon ſmall deal rafters and pantile laths only) was not in the leaſt injured either within or without, and perfectly prevented the fire from extending to any of the other buildings. In this inſtance it actually ſerved the purpoſe of *iron fire-plates*; for even the deal rafters and laths that ſupported it were only blackened by the fire on the ſide next it, as is the exact caſe with fire-plates; nay, the whole of the artificial ſlate and wood-work of the roof remains ſtill in the ſame ſtate the flames left them, and in ſuch perfect ſtrength and good condition that the owner of the works did not think it neceſſary to remove either. Had this office been covered with lead, blue plating or tiles, the principal building, which nearly adjoined, with all the valuable goods it contained, muſt have periſhed. Any gentleman curious to inſpect this extraordinary trial, may, by application to the agent at the artificial ſlate manufactory, or at the places under mentioned, where orders are taken in, obtain permiſſion to ſee the roof, which the owner of the works has been ſo obliging as to grant. Extraordinary reſiſtance of fire.

It is to be obſerved nevertheleſs, that the artificial ſlate muſt be conſidered complete like the ſpecimens ſent out, nor able to reſiſt the great attacks of fire here related, until it is like them entirely finiſhed on a roof — ſanded, painted, and expoſed a ſhort time to the air, when it ſoon petrifies: like the examples quoted in this book, it will then equally reſiſt the force of fire, lightning, wind, and water. — One gentleman only in Antigua, not attending Artificial ſlate not to be put to trial till complete.

to the above obſervations, and not duly reflecting on the trial he was about to make, was induced to quarrel with this excellent material. The proprietor, on hearing this, offered to take all his artificial ſlate again, though to the value of near three hundred pounds, and return him his money. But the gentleman was convinced of his error before the offer came, and was very well pleaſed to keep the ſlate. He had put a ſmall bit of it into the fire juſt as it came from on board; but it was then incomplete, as it always is till laid on a roof; beſides it wanted the metallic paint and ſand: it was alſo in its fermenting ſtate, in which it is always found when cloſe confined during its raw and green condition, and eſpecially in a ſhip's hold: the ſlate therefore cannot be expected to reſiſt fire in the ſtrong manner here deſcribed, until it is finally completed on a roof, and its internal foſſil and metallic ingredients are united with the paint aloes and ſand.

Artificial ſlate ſuperior to lead, tiles, &c.

From theſe and ſeveral other authentic teſtimonies hereto annexed it manifeſtly appears, that fire falling on roofs covered with the artificial ſlate cannot penetrate ſo eaſily as through lead, which will melt and ſet fire to the timber; and other ſlating, as well as tiles, will crack, and let in the flames to the wood-work: but the artificial ſlate will not only *not communicate* fire, but impede its progreſs, and oblige it to go out, as appears from the laſt recited example.

The original teſtimonies of theſe facts, and the preſent ſtate of perfect condition of the artificial ſlate roofs for eight years, may be ſeen at the manufactory by applying to the agent.—*Vide* the accounts at the end of this book, from Gregory Bateman, Eſq. the Mayor of Thetford, Mr. Gardener, Mr. Buck, and Mr. Dunning.

Artificial ſlate not to be ſtowed in the holds of ſhips.

That no detriment may in future accrue to the texture of the artificial ſlate ſent out to the Weſt Indies in its incomplete condition (nor can it be ſent in a more advanced ſtate, for then it would petrify too ſoon) it is ſtrongly recommended to thoſe gentlemen who have the ſhipping of the goods, that they will inſiſt on the packages being ſtowed between the decks, and on no account in the hold of the ſhip; the ſalt ſtench and foul air which often prevail there will materially damage the ſlate, thus green and unfiniſhed.

Great uſe of caſes and puncheons.

The caſes that contain the artificial ſlate, as well as the puncheons, will be found very uſeful, firſt in defending the ſlate from the leaſt waſte or detriment on the voyage; after this the former will ſerve perfectly well for boarding thoſe roofs which are intended for the artificial ſlate, and the latter be of much greater value in the iſlands than their firſt coſt in England will amount to. The caſes are three quarters of an inch deal, and when laid upon the rafters will make a proper boarding for the artificial ſlate roofs, and not only be ſtrong enough for that purpoſe, but alſo to admit walking on the roof, when the ſlates are

finiſh

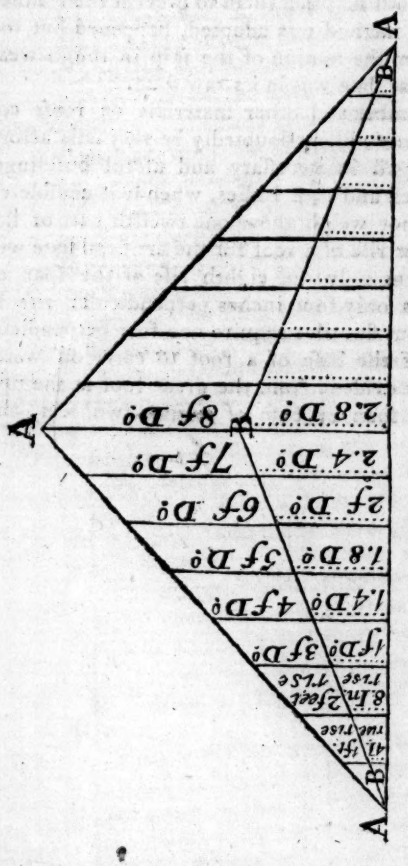
finiſhed on it and hardened; otherwiſe it would be imprudent, as the cement would be ſqueezed from the joints. The packing paper will be found as good as new when taken from the ſlates, it being uſed only to lie ſmooth between them to prevent their adheſion, which, before this method was adopted, happened but too often in long voyages from the motion of the ſhip in rough weather, and when the artificial ſlate was in its raw ſtate.

Small riſe of artificial ſlate roofs.

The great ſavings in timber and other materials on roofs covered with the artificial ſlate will undoubtedly be very ſatisfactory to every gentleman engaged in neceſſary and uſeful buildings, eſpecially thoſe in the Weſt and Eaſt Indies, when it is conſidered that this covering does not weigh above one twelfth part of flat tiles, and that the pitch or riſe of a roof for the artificial ſlate will perfectly carry off water at only one eighth riſe of the ſpan or baſe of a roof, which is only four inches perpendicular riſe in every foot of the baſe; but flat tiles require one foot perpendicular riſe for every foot of the baſe of a roof to carry off water equally well: this is very evident from the great roof at the manufactory, which has a ſpan or baſe of forty-two feet, and ſcarcely riſes ſeven.

The

The following drawing will probably exemplify this assertion very clearly:



Span or base line of two roofs, 16 feet long each.

A. A A. the rise a roof must have, covered with flat tiles, to carry off water.

B. B. B. the rise a roof for the same house may have, covered with the artificial slate, to carry off water.

The dotted lines mark the perpendicular rise per foot of the base of the artificial slate.

The black lines mark the perpendicular rise per foot of the base of the tiled roof.

Perhaps in a country much subject to snow it may be prudent to raise five inches in a foot, and even then it will be flatter than what is called *pediment pitch*, which is the flatteſt at which blue or Welch slating can be laid to carry off the water, and that only on pediments, for they must have a much higher pitch on roofs to keep out rain and snow. From these observations it is clear much timber and other articles are saved in the pitch alone.

Artificial slate noxious to mice, &c.

The artificial slate is now made noxious ro rats, mice, and every kind of vermin and insects, which in hot climates so often devour the wood-work of buildings. It is presumed too, that neither the white ant in the East Indies, nor the wood louse in the West Indies, will approach this material. Besides, no green, not even the most

moſt minute vegetable, will grow on the artificial ſlate to deface its beauty, or injure the texture. This cannot be ſaid of any other covering.

It will not be unacceptable, it is hoped, to the gentlemen concerned in the Weſt India property, to be informed of the favourable opinion the artificial ſlate has long ſince obtained in the Leeward Iſlands. It was firſt introduced at St. Kitt's ſome years ago; ſince which commiſſions have increaſed ſo conſiderably, not only from that iſland, but from moſt of the others, that it has not been poſſible till now to get a tolerable ſtock beforehand. Gentlemen are therefore deſired to ſend their orders as long as poſſible before the goods are wanted. Great demand for ſlate.

The following abſtract is copied from a letter communicatd by Mr. Neave to the preſent patentee, from a gentleman who has long had the care of a large eſtate belonging to the Stapleton family at Baſſe-terre in St. Kitt's, and whoſe long reſidence and experience in the Weſt Indies make him perfectly acquainted with the great expence, inconvenience, and danger, which attend the conſtant uſe of ſhingles, and for which the artificial ſlate is recommended as a ſubſtitute.

St. Chriſtopher's, November 28, 1777.

" I have now finiſhed the room for a trial of the artificial ſlate " which was ſent out, and I muſt take the liberty to inform the " gentleman who is the proprietor of that manufactory, that I " have every reaſon for believing that it will anſwer perfectly; " and if a houſe that is covered with it will bear the intenſe heat " of a houſe on fire that is contiguous to it without catching the " * flames, it will prove the moſt uſeful diſcovery to our Weſt " India towns that ever has been made: it will likewiſe be of " very great conſequence, and an additional ſafety to the ſugar " works on the eſtates. Several of our towns have of late years " been deſtroyed by fire, to which they are much expoſed from " the nature of their inflammable materials, but which might " have been prevented, had the houſes been roofed and fronted " with this uſeful and ingenious invention; inſtead of which, all " our houſes here are covered with ſhingles, which are juſt as in- " flammable as any other part of the wood of the building; our " roofs in general being too ſlight to admit of a heavy covering, " ſuch as the common ſlate or tiles.

" You will pleaſe alſo to mention that our air is certainly im- " pregnated with a much ſtronger corroſive quality than the air " of England, which may be owing to a ſuperior degree of moiſ- " ture. All kinds of iron from this cauſe ruſt and decay very " faſt in this climate. I therefore ſubmit it to him, whether it " would not be better to have the nails that faſten the artificial

* See Mr. Dunning's affidavit.

" ſlate

" ſlate, made of ſome mixed metal rather than iron, ſo as to reſiſt " that quality in our * air; but care muſt be taken at the ſame " time that the compoſition be of ſuch a nature as to give them " ſufficient ſtrength and ſubſtance for the purpoſe they are in- " tended of ſometimes driving into hard wood.

" I am, with the greateſt reſpect, &c. &c.

(Signed) " ROBERT THOMPSON."

More advantages of the artificial ſlate.

It muſt be farther obſerved, that this material has a great advantage over ſhingles in the Weſt Indies in reſpect to painting, as every gentleman, who keeps his ſhingled roofs in perfect repair, knows they ſhould be painted every other year; and even with theſe expenſive precautions they ſeldom laſt above ſixteen years. This is therefore a rent charge of no inconſiderable extent on the eſtates.

Shingles require much painting, artificial ſlate but little.

Beſides the expence of painting wood-work ſo as to reſiſt out of doors, even in England where the Sun is leſs penetrating, cannot be leſs than four or five ſhillings per ſquare; that is, an hundred ſuperficial feet: but two ſhillings and ſixpence will purchaſe a ſufficient quantity of metallic paint to complete the ſame meaſurement on the artificial ſlate.

Again, the artificial ſlate requires not only to be painted leſs often than ſhingles, but when painting becomes neceſſary, it takes a much leſs quantity. The reverſe is the caſe when ſhingles are painted; the quantity of colour uſed on them is much greater, their ſuction being much ſtronger than that of the artificial ſlate: beſides, the ſhingles, by being frequently painted with common paint, become more and more of an inflammable nature, which is not the caſe with the metallic paint. For theſe and many other reaſons that might be advanced, it is ſtrongly recommended to the Weſt-India gentlemen to make uſe of the metallic paint upon their ſhingles, or any wood-work of their buildings; for it is both more durable and cheaper than what can be purchaſed elſewhere.

Shinglers fit to lay the artificial ſlate.

It is to be obſerved, that thoſe *Blacks* who are employed as ſhinglers may eaſily learn to lay the artificial ſlate, by accurately obſerving the inſtructions herein publiſhed. And indeed it is on account of the great demand for this material in our ſugar colonies that theſe copious particular directions have been principally drawn up.

Artificial ſlate becomes one body on a roof.

It is worthy of obſervation, that while other coverings lie in detached parts, the artificial ſlate, when completed on a roof, will, in the courſe of a few weeks, become as it were one united body, extending over the whole roof of a building, and has the effect of

* A method has been found to temper braſs nails ſo as to take off their brittleneſs, and they have been found to anſwer their purpoſe perfectly, intermixed with the iron and bearded ones.

hermetical

hermetical ſealing, totally excluding wind, water, ſnow, and even air itſelf.

The fulleſt and moſt minute directions that could be thought of for properly laying the artificial ſlate are herein given, as well as inſtructions for framing the leaſt expenſive roofs. By the aſſiſtance of theſe and the eſtimates, gentlemen as well as artiſts may clearly judge whether this material is, or is not a deſirable and economical ſubſtitute for moſt others in the generality of houſes.

The art of building is become ſo expenſive, even in the moſt ordinary erections, as to deter moſt perſons from engaging in it, unleſs compelled by neceſſity. In this latter caſe, ſo much timber and coſtly articles are ſaved by the uſe of the artificial ſlate, that no one, after the above proofs, can doubt but that it is a very economical material, and therefore well worthy the attention of all who undertake buildings.

Abuſes of the artificial ſlate to be avoided.

Notice has been already taken of the impropriety of cenſuring the artificial ſlate, when put to unfair trials, and uſed with careleſsneſs. The following abuſes have occaſioned its want of perfect ſucceſs in ſome few inſtances at its firſt eſtabliſhment. The proprietor therefore mentions them here that they may be avoided in future.

Firſt, From not repainting the ſlate every third or fourth year, as recommended in the directions.

Secondly, From the uſe of common paint inſtead of the metallic paint, which is prepared on purpoſe at the manufactory.

Thirdly, From the uſe of all iron nails inſtead of braſs ones intermixed with them.

Fourthly, From not allowing the artificial ſlate to have ſufficient lap.

Fifthly, From not allowing boarding for the artificial ſlate to lie upon; a more ordinary one than what is uſed for common blue ſlates will do; ſome is abſolutely neceſſary to ſupport them during their new and unſettled ſtate, as well as to make them lie even. Where this precaution is wanting, the texture is ruined before it hardens, and the artificial ſlate becomes concave inſtead of flat.

Sixthly, From allowing too great diſtances between the rafters of a roof, which will alſo cauſe this concavity.

Seventhly, From not giving a common rough cieling to roofs covered with the artificial ſlate. This is a very material injuſtice, and has ſometimes happened, eſpecially in open ſheds and ſtables. Hence the moiſt air condenſing, and conſtantly hanging on the inſide of the ſlates during their green, unpetrified ſtate, materially injures the texture of the internal ſurface; for it is to be remembered that the internal ſide of the artificial ſlate is not equally prepared to reſiſt damp and moiſture with that which lies expoſed to the open air. On this account it is requeſted, as abſolutely neceſſary, to put ſome ſort of cieling under all roofs covered with

the artificial ſlate, inſtead of leaving its inſide ſo much expoſed to the penetrating air of fogs, froſts, &c. &c.

The moſt ordinary cieling will effectually prevent the condenſation of the internal air, which otherwiſe will collect on the inſide of the ſlates, and not being able (except by repeated efforts) to penetrate them, will fall down in large drops, like the rain that precedes a thunder ſhower. This circumſtance has induced ſome people to ſuppoſe a defect or leakage in the artificial ſlate; whereas it is a confirmation of its reſiſting moiſture and wet, and being impenetrable to air in foggy and froſty weather, where the neceſſary inſtructions have been followed.

Stables. In ſtables it is ſtill more neceſſary to have ſome ſort of common cieling, becauſe the animal ſalts that proceed from the dung will infallibly diſunite the vegetable ſalts that abound in the artificial ſlate, and which in their unhardened ſtate are not able to reſiſt the force of the former. Nor is it poſſible to ſuppoſe theſe little expences will not be chearfully ſubmitted to, when on the other hand the ſavings and advantages are ſo great that ariſe from the uſe of the artificial ſlate, which, it muſt be obſerved, was never intended to ſerve both as a roofing and a cieling too.

It is an error to lay the artificial ſlate as flat as lead. Another diſadvantage to this material has proceeded from the partiality of ſome gentlemen too much prepoſſeſſed in favour of the artificial ſlate. Suppoſing it capable of more than it ever had pretenſions to, they have not only made it ſerve both for roofing and cieling, but have laid it as flat as lead, even when new. Whatever it may be capable of when completely hardened, the proprietor does not pretend to determine; but it is contrary to every wiſh of his ever to lay it as flat as lead, or at any other pitch than what is recommended in the printed directions, which is a very low one, and by which it is evident much timber and other materials are ſaved.—Vide Eſtimates.

Wherever the little attentions and expences herein recommended have been attended to, ſucceſs has invariably been the reſult, as is particularly proved by Mr. Buck's houſe in Norfolk *, and all the buildings at the manufactory at Woodford Bridge. At the former the artificial ſlate has remained in a perfect ſtate for fifteen years, and at the latter above eight, without any other care and attention than what is recommended in this book of inſtructions.

It may reaſonably be allowed farther to expect, that when ſo much is ſaved to the purchaſers of the ſlate, in timber, lead, and other materials on roofs and fronts, no gentleman will object to the trifling expences of an ordinary boarding and a common cieling; and both are neceſſary. Conſider only the great expence of

* The buildings belonging to Gregory Bateman, Eſq.; Mr. Wolf at Saffron Waldon; that of John Addey, Eſq. at Norwich; and others beſides.

repairing

repairing tiled and ſlated roofs in the courſe of fifteen or twenty years, when they have been ſubject to as many winters, to as much froſt and rain as the artificial ſlate. Conſider, beſides, the danger from fire, and the injury which frequently happens to roofs covered with tiles or common ſlate, from the overflowing of gutters in heavy rains, or the ſudden melting of ſnow. When theſe happen they ſeldom fail to ſpoil the cielings under, and frequently the hangings and furniture: nor can the very trifling expence be regretted of giving the ſlate a light coat of metallic paint now and then by the hands of a common labourer, which not only beautifies the roof, but, every time it is renewed, adds to its durability. In very damp northern climates perhaps it may be prudent to paint the roofs a year ſooner than is here recommended.

Dry rot.

It has already been obſerved, that the artificial ſlate has been found a very efficacious remedy behind wainſcots and under floors, againſt the ravages of what is called the *dry rot*. Some extraordinary proofs of this were made at Ray Houſe; at Mr. Towers's fine room at Weald, in Eſſex; and in Mancheſter Square.—For particulars inquire at the manufactory.

This quality of the artificial ſlate was diſcovered by an accident; and as it ſeemed at firſt to the proprietor to be almoſt unaccountable, his curioſity led him to examine minutely into the cauſes of the misfortune which ſo frequently ruins the timbers and woodwork of houſes. From what he has obſerved, he is induced to think that the *dry rot* proceeds from the following cauſes, which, if true, account in a great degree why the artificial ſlate ſhould be a remedy againſt it. He ſpeaks nevertheleſs with great deference towards the naturaliſts, as well as towards thoſe gentlemen in the building profeſſion, who probably have ſearched with great pains and ingenuity into the cauſe of this common and often dangerous diſaſter.

It has been advanced, and muſt be allowed, that the artificial ſlate, from its foſſil and metallic ingredients and its elaſtic nature, is a perfect enemy to every kind of vegetation, becauſe, from its firſt invention, it has not ſuffered the leaſt green or plant to grow upon it.

Dry rot erroneouſly called ſo.

What is called the *dry rot*, the proprietor preſumes may with more juſtice be called the *wet rot*; and its conſumption of woodwork (if this conjecture is right) proceeds not from the effuſion of drains, or other peſtiferous matter, as has been generally ſuppoſed, but from the ſubtile ſeed, conveyed perhaps from ſuch effluvia, and produced from a moiſt, humid plant, which plainly appears in the microſcope to be that white cobweb which always precedes the rot. How the ſeed of this plant is conveyed into thoſe parts of the timber where the rot prevails, belongs to the more curious philoſopher to aſcertain, who has time to inveſtigate its progreſs at large; but it may not be improbable that the timber has lain, ſome time after it has been cut for uſe, in a damp or fœtid ſoil which abounds with the ſeed of this plant, or that

ſome drain, or other damp place containing the ſeed, may not be far diſtant from the place where the rot commences. Certain ſoils in different countries may alſo be more pregnant with this ſeed than others.

The hypotheſis then being admitted, that the rot proceeds from a plant, and the artificial ſtate being, as we have always experienced it, noxious to vegetation, it is eaſy to determine why it cauſes this diſorder to ceaſe, or not to commence; for as by its nature it prevents the ſeed from growing, of courſe the matrix for the plant is defective, and becomes abortive as ſoon as it is begun.

DIRECTIONS

* Since the printing the directions for laying the artificial ſlate on roofs, a moſt excellent method has been diſcovered, viz; When a boarding is finiſhed on the rafters of a roof, nail on exactly over each rafter, all the way down, ſlit deal fillets, about 1½ or 2 inches wide, and one third of an inch thick, rounded off, or weathered on each angle of the upper ſide; lap and nail the artificial ſlate over the fillets, but let every other nail be a little zig-zag, not in a ſtraight line, and never drive the nails ſtraight, but a little inclining either way. This method will make the artificial ſlate lie hollow down their centers, which effectually prevents any water getting through the cement, even ſhould intenſe heat or froſt crack it.

‡ It has alſo been found that the beſt method is to varniſh over the ſlate with the prepared oil (after the firſt painting and ſanding) and to finiſh with the metalic paint over the oil varniſh.

DIRECTIONS *for* LAYING *the* ARTIFICAL SLATE *on* ROOFS *and* FRONTS.

IN the firſt place great care ſhould be taken to form the roofs and fronts of buildings to be covered with artificial ſlate, together with every part of the wood-work, of perfect dry *ſeaſoned ſtuff*; and the framing ſhould be ſo contrived for fronts, that a whole ſlate may be placed exactly in the center of each alternate row of ſlating, which will always give it a regular finiſh at the ſides or ends of the front.

Roofs to the artificial ſlate to be formed with ſeaſoned ſtuff.

The roof is to be formed with rafters made of fir, or any other cheap timber not ſubject to warp, two inches thick, and four and an half deep, placed at the diſtance of one foot four inches from the center of one rafter to the center of the next; the roof is then to be cloſe boarded with three quarters boarding, and never more than five inches broad, which is the beſt prevention from warping; in a ſhort bearing, or to a ſmall roof, every other rafter may be only of inch deal, but four and half in depth.

And half an inch of void between each board.

Care muſt be taken in nailing on the ſlates that the nails are not driven where there is no wood to receive them. Thoſe who nail the ſlate on roofs, and paint it when nailed and cemented, ſhould ſtand and kneel on a board, that their feet and knees may not indent the artificial ſlate while new; they ſhould alſo take care that they are no where broken or bruiſed beforehand, or at the time of laying on, which will ruin their texture. Theſe precautions are only neceſſary in the firſt inſtance, while the ſlate, cement and paint are freſh and unhardened. In a ſhort time the whole will unite and become firm, and may be walked upon.—See the manufactory roofs.

Nailing the ſlates.

The joinings of the artificial ſlate where the cement is put, and the heads of the braſs and iron nails, which will be a little counterſunk, muſt all be cemented, and be both rubbed over, as ſoon as done, with a little thin metallic paint, ſo that the cement be left ſmooth and even: if this is neglected, it will not unite, but crack in drying, and ſeparate from the covering.

Joints and heads of nails to be painted.

Let ſmall holes be made in the artificial ſlates at the given diſtance with the brad-awl, which is ſent out for the purpoſe, but on no account with a larger inſtrument, which would not only prevent the bearded nails from taking a proper hold of the covering, but alſo hinder the plain ones from being fixed cloſe.

Slates to be bored with the brad-awl.

When a roof or front is ready nailed and cemented, and the joints and heads of the nails painted ſlightly, according to the rules laid down, let it be painted and ſanded the next day, the roof with the blue metallic paint and the front with the white, and of the conſiſtence only of cream. Let ſome one follow the painter, and while the paint is wet, fling on it with an even hand from

Method to paint roofs and fronts.

from the ſanding box ſome of the prepared ſand, which is ſent out for this purpoſe.

In a week, if there is fair weather and no rain, and the firſt painting is perfectly dry, and the ſand adheres firmly, firſt ſweep off with a hair-broom all the ſand that does not adhere to the paint, then repeat the above painting and ſanding in the ſame manner. In about ten days more the roof muſt be painted over a third time, but without any ſanding, as it muſt be finiſhed with the paint.

Obſerve that fronts muſt be painted with the white metallic paint, and only painted and ſanded twice, and be finiſhed with the ſand. In about three weeks the front will petrify and bleach to the colour of freeſtone.

Obſerve too that all the artificial ſlate muſt lap at leaſt an inch, both on roofs and fronts, and the cement laid equal, and never beyond the thickneſs of a crown piece.

Remedy againſt the heat of the artificial ſlate in garrets.

It has been noticed, that in remarkably hot expoſures in the Weſt Indies the artificial ſlate has been hotter in the garret floors than other coverings where the cieling has been low. But this inconvenience has been eaſily removed, and at a trifling expence. The method has been to fill up cloſe the ſpaces between the rafters and the laths of the cieling with ſtraw, reeds or ſtalks of the Guinea corn, and in the Eaſt Indies with cajan, ſmall bamboo, or rice ſtraw.

An ingenious gentleman from Nevis, well verſed in building in the Weſt Indies, having made much uſe of the artificial ſlate on his own eſtate in that iſland, and who from conviction of its great economy and ſafety to buildings has been a great promoter of it upon many other plantations, has informed the proprietor (among many other uſeful things, for which he is greatly obliged to him) that the metallic ingredients of the paint have frequently ſubſided to the bottom of the caſks, eſpecially during Summer voyages, and become ſo very hard that it has been found impoſſible not only to remix them with the fluid part of the paint, but even to reduce the ſediment to any kind of pulp or powder, either by heat or levigation. The proprietor therefore, to render this neceſſary part of the manufacture as perfect as poſſible, has contrived to ſend out the metallic ingredients in *powder*, which, with the following inſtructions how to mix them, will anſwer as well as if prepared at home. Let the mixture be made as follows:

Ingredients of the metallic paint, why ſent out in powder.

Method of mixing the paint.

To every gallon of paint add eight ounces of the powder of metals taken from the little caſk arked ✠. Let the powder be added by little and little, ſtirring it well for half an hour; then grind the whole together on a colour ſtone with a muller, adding alſo to every gallon of paint five ounces of *Barbadoes aloes* as finely pulveriſed as poſſible, which muſt be well and equally incorporated with the paint; it is then fit for uſe. It is to be obſerved, that the aloes in powder is an indiſpenſable ingredient, as it unites together

gether the metallic articles in the paint; it is therefore on no account to be neglected.

If the paint ſhould be too thick in the Weſt Indies when the powder of metals and aloes is added to it, unite with it a ſufficient quantity of the prepared oil, to make it of the conſiſtence of cream or thin paint. It is a great error to lay on the paint too thick, and much better to do it ſlightly and repeat it, than to lay on too much at a time.

Sort of aloes.

The ſpecies of aloes intended for this mixture in the Weſt Indies is that which is firſt boiled and hardened. Obſerve it muſt afterwards be reduced to a fine powder. It may be had in great plenty in moſt of the Weſt-India iſlands, particularly at *Barbadoes*, where it is principally manufactured, and where a conſiderable traffic of it is carried on with Europe.

In England the paint is prepared with the metals and aloes.

Method of laying the ſlate.

The beſt method of laying the artificial ſlate on roofs, as well as fronts, has been found by repeated experience to be where the joints are broken, as in brick work, termed by the builders *breaking bond*, as deſcribed in fig. 1. page 20. This is the method which ſhould be followed, and no other does the proprietor recommend.

Slate only one twelfth the weight of tiles.

It is no inconſiderable advantage that the artificial ſlate admits roofs covered with it to be laid ſo much flatter than they can be with tiles, or common blue ſlating; as alſo that it is only one twelfth part of the weight of flat tiles.

Savings in lead.

The eſtimates will ſhew alſo what aſtoniſhing ſavings there are in lead, for which the artificial ſlate ſerves in all parts of a building as a perfect ſubſtitute; as on pediments, hips, ridges, barns, ricks, valley and other gutters, water pipes, bow and ſhop windows, domes, flaſhings of windows, copings of walls and chimnies, and window ſills.

Nails.

Let the nails with heads be driven every other one: this will prevent the coverings from being drawn away from the rafters, as has ſometimes been the caſe in very hot expoſures.

Slate not to touch mortar.

The joints of brick work (wherever the edges of the artificial ſlates are obliged to terminate againſt ſhafts of chimnies and upright walls) muſt have all their mortar raked out; or a chaſing ſhould be cut in the brickwork, which muſt be painted to receive the edges of the ſlate. Theſe ſhould be inſerted an inch and half into the joint or chaſing, then filled up with cement, and painted and ſanded. On no account ſhould the artificial ſlate be laid upon mortar, or at all communicate with it.

The firſt year it is neceſſary every now and then to examine whether there is any little defect in the cement, nailing, or painting, eſpecially before and after the firſt winter; and it is prudent to walk as little as poſſible on a roof, or to load it with weight till the whole is hardened, and the cement runs no riſque of being ſqueezed out of the joints. For want of theſe ſmall attentions

ſome

ſome roofs have received material damage, and by a continuation of neglect muſt come to decay, though they might otherwiſe have been kept in the moſt perfect condition for many years.—See Mr. Garland's letter, page 26.

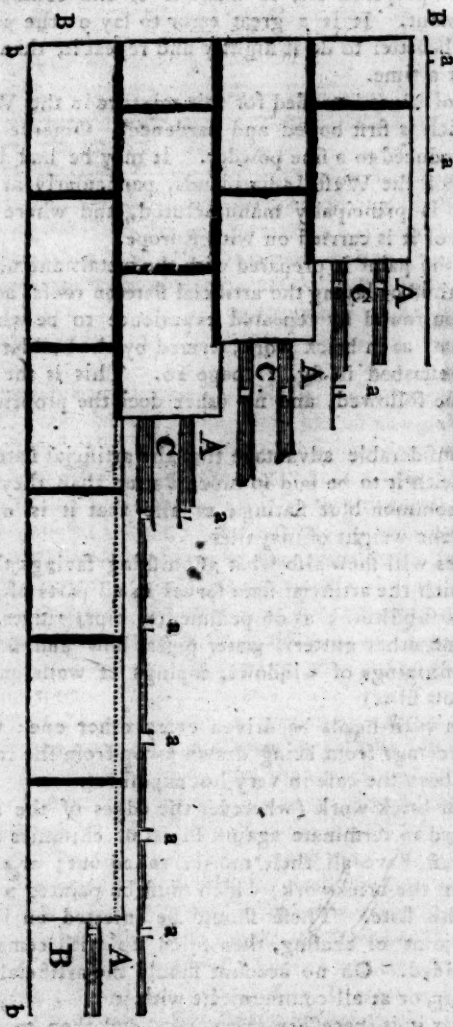


Fig. 1.

The artificial ſlate muſt be laid, and the joints broken on roofs and fronts of houſes, as in fig. 1.

Chalk a line on each row of ſlates.

On roofs and fronts, it is neceſſary to ſtrike a ſtraight chalked line to lay each row by, as ſhewn by the dotted line . . . . . b. b. fig. 1. and this ſhould be continued all the way to each row as it is laid. When you have laid the firſt row of ſlates, ſtrike the line

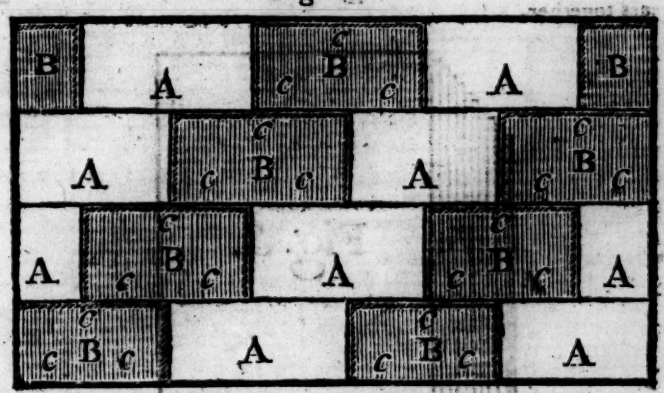
line on the upper part of it; this will direct you to lay the next by; and remember to bring the roofing square as you proceed in laying, always beginning at the bottom both on roofs and fronts, as in fig. 1. B. B. executing your work always before you.

The quarters in fronts should be placed at the distance of 13 inches from the center of one quarter to the center of the next, as in fig. 1. a a a a Quarters in fronts.

The scantling and size of the quarters in front should be about four inches deep by two broad, and close boarded within half an inch, as on roofs, but the boards not above four or five inches broad, to prevent warping, as has been observed on roofs.

It is best to sand and paint both roofs and fronts in fine weather, and on no account to attempt either when it is damp or rainy. The metallic paint and sand unite best in a fine day; besides, when there is little or no wind, the prepared sand will not be wasted. The eye of the workmen will easily distinguish where to repeat the sanding the second time, a little more or less. Painting to be done in fine weather.

Fig. 2.



Bottom of a Front.

Observe in fronts, and in fronts only, to lay the artificial slates in such a manner, that every other one in every row may have its upper side lapped over at the usual inch by the slates that are above it, its lateral sides by the slates that are next them; and that its under side may lap in the same proportion over the slates that are below it. By this method every other slate will be a slate's thickness higher than the rest, as in fig. 2. A., and the slates B. with their three sides c c c, will of course be a slate's thickness lower. Continue to lay the whole front thus, and it will have a beautiful effect, resembling exactly the joints of stone work. Remember that the artificial slates intended for the fronting of buildings must be particularly mentioned in the orders, as Method of fronting with artificial slate.

they are differently prepared from thoſe employed on roofs, and will be marked in chalk with the letter F.

Nailing and the heads of nails cemented.

On the longeſt ſides of the ſlates ten or twelves nails muſt be driven, on its ſhorteſt five or ſix; let every other nail on roofs be one with a head to it, but on fronts every ~~other~~ one a bearded one without a head.

When the nailing of the covering is finiſhed, remember to cement over the heads of the nails, both on roofs and fronts, and then paint them with ſome of the paint, uſing the white for the fronts, and the blue for the roofs.

It is very remarkable that the ſand will ſet and much ſooner harden and unite on the artificial ſlate than on wood, or any other material.

By repeating the operation of ſanding and painting about a fortnight after the firſt is done, the ſurface of the front of a building will become not only as beautiful as freeſtone, but promiſes fair to be equally laſting, as it has been obſerved to grow harder and harder every year without the leaſt repair — even painting on the fronts has not been neceſſary at the manufactory for above eight years together.

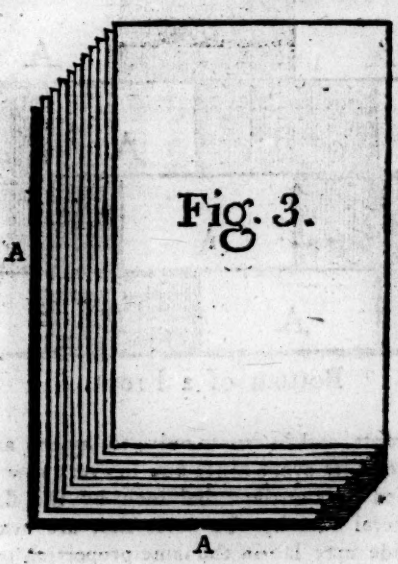


Fig. 3.

Method of cementing ſlates.

Care muſt be taken that every ſlate is properly cemented before it is laid; and that ſhould be done before the ſlate is brought to the roof or front it is to cover. The cement muſt be laid only on one of the ſhort and one of the long ſides of each ſlate; the beſt and moſt expeditious method of doing which, will be to take eight or ten ſlates, and lay them one on another on a ſmooth table, and place them an inch apart one above the other, as in fig. 3.

fig. 3. A A; then with the cementing knife ſpread the cement at the thickneſs of a crown piece on each projecting inch of the long and ſhort ſides of the ſlates, as fig. 3. A A. If the cement is grown hard and ſtiff, it muſt be diluted and made thinner with a little of the prepared oil well mixed and beat into it.

Stir the metallic paint.

While uſing the metallic paint, ſtir it every now and then in the pot with a round ſtick about a foot and an half long, and of the ſize of a mop handle, with two flat ſticks acroſs that end which goes to the bottom of the pot, which, by moving about like a chocolate muller, will prevent the metallic matter from ſubſiding to the bottom. In laying the artificial ſlate on roofs as well as fronts, care muſt be taken to lay that ſide to the weather which is marked with a chalk ſtroke.

Reſiſtance of the artificial ſlate to ſhot.

The great reſiſtance of the artificial ſlate to a muſket ball at a ſmall diſtance is very remarkable. Minutes of the experiments made may be ſeen by applying to the agent at the manufactory; and for this reaſon it is thought it may be a very proper ſubſtitute for mantelets, and ſerve other military purpoſes in fortifications, as well as ſome uſes on board ſhips of a ſimilar nature.

Many more caſes might be added relative to the merit of this material, beſides thoſe alluded to in this publication; but it is preſumed that it needs no others than thoſe already enumerated to induce gentlemen, eſpecially thoſe in the Eaſt and Weſt Indies, to try the great uſe and œconomy of it. Theſe advantages will be pretty certain, if the inſtructions here recommended are duly obſerved in laying it properly at firſt, attending to the joints the firſt year, and repainting it every fourth year.

Proofs of the facts of the printed eſtimates, under the hands of the ſurveyor, as alſo the particulars of other eſtimates and drawings of many roofs that have been covered with the artificia ſlate, may be ſeen at the manufactory, and copied for uſe, as well as the ſcantlings of timber proper for the different ſized roofs.

Models of roofs.

Alſo may be examined at the manufactory, models of roofs that are proper for blue ſlate tiles and thoſe for the artificial ſlate, whereby the great ſavings ariſing from the uſe of the latter will at firſt ſight evidently appear.

If any of the artificial ſlate are to be cut leſs, or to any particular ſhape, it muſt be done with a large broad ſteel chiſſel, without any vaſil to it, ſuch as are ſent out on purpoſe from the manufactory, placing the artificial ſlate on a hard thick level piece of wood, and ſtriking the chiſſel with a wooden mallet where the ſlate is intended to be cut. Without this precaution the texture of it will be bruiſed and much injured, eſpecially when petrified.

ARTIFICIAL SLATE WATER PIPES and GUTTERS.

A Machine having been invented by the proprietor, and approved of by the ingenious Mr. Smeaton, for caſting this material into a cylindrical form, very neat pipes have been made for the conducting of water from the roofs of buildings; and all the trials hitherto made for five years paſt having met with the compleateſt ſucceſs, it is reaſonably preſumed, from the conſtant durability of the pipes, without any repair, that on an average of ten or twelve years they will prove even cheaper than thoſe made of wood, which are very ſubject to leakage, and often want freſh pitching. It may perhaps be added with ſome degree of confidence, that they will be equally laſting with leaden pipes, though of the ſame diameter they ſell 150 per cent. cheaper.

Water pipes perpendicular.

Theſe pipes have been uſed above five years as perpendicular conduits of water from the tops of houſes with the greateſt ſucceſs, and even without repainting.—See their application in this particular at Ray Houſe, and at the manufactory.

Gutters.

This material has anſwered perfectly well for gutters alſo.—See their application at Ray Lodge.

Pipes under ground.

It is farther to be obſerved, that thoſe pipes have very unexpectedly for four years perfectedly reſiſted every impreſſion from the weather, the damps of the earth, and the deprivation of the air, having been uſed *under ground* for the conveyance of water.—See a drain which carries off all the water from the roofs at Ray Houſe.

About the ſame diſtance of time Thomas Knight, Eſq. late member for Kent, laid a very great length of theſe pipes under ground at his ſeat at Godmerſham Park in that county, for conveying water from a large reſervoir to his kitchen garden, and they have anſwered perfectly. He bedded the pipes in ſand according to the rules followed at Ray Houſe. He had the additional precaution to lay pantiles over the ~~ſlates~~, which ſeems to be an excellent improvement; but thoſe at Ray Houſe have as yet ſtood perfectly well without them.

Pipes

The proprietor invented for Mr. Knight's conduit two ſmall copper tubes, which join on to the artificial ſlate pipes with cocks to them; the one end for the admiſſion of water from the reſervoir, the other for the delivery of it at the garden, which have ſucceeded perfectly well.

Godmerſham Park,
July 12, 1786.

MY DEAR SIR,

THE artificial ſlate water pipes have hitherto ſucceeded very well with me; I have had no occaſion to take them up for any repair, and the water has been as regularly and uninterruptedly ſupplied

ſupplied as I could wiſh. The copper tubes likewiſe ſeem to perform their office very well, and I have had no complaint made to me as yet of either, &c. &c.

(Signed)
THOMAS KNIGHT.

It is reaſonable to ſuppoſe from theſe and other ſimilar proofs, that the artificial ſlate pipes will anſwer under ground where no force is uſed, as well as in a perpendicular direction as upright conduits of water. In this laſt particular it may reaſonably be conjectured that they will laſt in a perfect ſtate longer than lead, not being by the moſt violent ſun or froſt ſubject to crack, as is too often the caſe with lead pipes; therefore the pipes muſt be a moſt œconomical ſubſtitute for that article, and will be found very uſeful in London wherever wooden trunks are permitted, as in uniting leaden pipes from the firſt floor to the bottom of the area of houſes, by which a great expence would be ſaved.

The pipes are very light, conſtructed ſo as to join eaſily together, and may be fixed by any common carpenter. As they are four inches in diameter, the inconvenience is obviated, which but too often happens to common lead pipes, which from their dearneſs are ſeldom above three inches diameter, and ſometimes even leſs; and from their thinneſs are often ſubject to be damaged when expoſed to much heat or cold, for theſe ſmall inferior ſort are uſually of milled lead; but the artificial ſlate pipes have double the thickneſs, and their diameter as large as that of the biggeſt lead pipes in London: the diameter of theſe ſeldom exceeds four inches, yet they are ſold at five and ſix ſhillings per foot; but the artificial ſlate pipes, though of the ſame ſize, are ſold for only twenty-two pence per foot at the manufactory.

C O P Y

Of a Letter from GREGORY BATEMAN, *Eſq. to the preſent Patentee, from whom he has for ſeveral years had conſiderable quantities of the* Artificial Slate.

Kentiſh Town Houſe,
May 25, 1785.

SIR,

THE artificial ſlate I have had of you ſince the year 1780 wears ſo well and looks ſo handſome, that I think I ſhall never uſe any other coverings. I beg to know if I can have 270 ſlates and the materials, and what day they will be ready, when my cart ſhall call for them.

I am, Sir,
Your moſt obedient humble ſervant,
(Signed) GREG. BATEMAN.

COPY

COPY

Of Mr. BUCK's *declaration of the durability of Artificial Slate for ten years, without any repair.*

London, 20th Feb. 1781.

MR. BUCK, of the city of Norwich, ſolemnly declares, that, to the beſt of his memory, his preſent dwelling-houſe at Stoke Holy Croſs, in the county of Norfolk, was entirely covered and roofed with the artificial ſlate about ten years ago, or thereabout; and he is firmly perſuaded, that ever ſince the ſaid houſe was firſt covered, it has never been repaired, and has very effectually kept out rain, ſnow, and all kinds of bad weather.

He farther declares, that he has almoſt conſtantly reſided with his family in the ſaid houſe, near theſe three laſt years; and he can poſitively affirm, that the ſaid roof of artificial ſlate has never wanted the leaſt repair whatever: that it is ſtill in perfect condition and repair, and as good, to all intents and purpoſes, as the firſt moment it was laid on; with this remarkable difference, that being pliable at firſt, it is now become as hard as iron, and effectually anſwers every purpoſe of a complete covering to a houſe.

In witneſs whereof I have affirmed this declaration.

(Signed) RALPH BUCK.
Witneſs, JOHN ARMSTRONG.

COPY

Of the Mayor *of* Thetford's *Letter, of the reſiſtance of fire of the Artificial Slate, dated 25th Dec.* 1776.

SIR,

YESTERDAY morning, about nine o'clock, I was greatly alarmed by a fire breaking out on one part of my premiſes, but thanks be to God we got it out preſently with very little damage; ſome of the ſpars, or laths, were burnt, and the covering ſcalding hot; but the fire had no effect upon it: I was forced to cut it off to throw in water. Send me thirty ſlates to the White Hart, in St. Peter's, &c. &c.

(Signed) WILLIAM HOLMES.

COPY

Of a Letter from Mr. GARLAND, *a gentleman of fortune and character, at Norwich, dated Nov.* 27, 1779.

SIR,

I AM glad to find that the patent for the artificial ſlate is fallen into hands likely to puſh it on with ſpirit, as I am convinced, from ſome years experience, that it is of all covering the beſt,

beſt, if properly manufactured, laid on, and attended to the firſt Summer. The objection ſtarted againſt it, by its enemies, being ſubject to take fire, alarmed me not a little; but being an eye witneſs at a place where a building was burnt, partly covered with the artificial ſlate, the morning after the fire I examined the ruins, and found the ſpars burnt to a coal, and the artificial ſlate, on the ſame ſpars, not much damaged; ſince that time I have been perfectly compoſed in the midſt of moſt dreadful lightning.

(Signed) THOMAS GARLAND.

JOHN DUNNING's *Affidavit, 10th March,* 1780.

City of Norwich, to wit. } BE it remembered, that on the 10th day of March, in the year of our Lord one thouſand ſeven hundred and eighty-one, John Dunning, of the city aforeſaid, maſter carpenter, came before me, John Thurlow, Eſq. Mayor of the ſaid city, and voluntarily made oath, that for ſeveral years laſt paſt, he the deponent hath been employed by John Addey, of the aforeſaid city, Eſq. one of the Aldermen of the ſaid city, in his the deponent's ſaid buſineſs of a carpenter; and the deponent farther ſaith, that upwards of a year ſince a fire accidentally broke out in a certain outhouſe or building in the aforeſaid city, belonging to the ſaid John Addey, which ſaid outhouſe or building was covered with a certain compoſition called artificial ſlate, made by Mr. Henry Cook, late of Stoke Holy Croſs, in the county of Norfolk, who, as this deponent hath been informed, and believes, obtained the King's patent for the ſole making and vending thereof; and the deponent farther ſaith, that he was preſent at the ſaid fire ſoon after it was diſcovered, and continued preſent thereat until it was extinguiſhed; and that the ſaid fire burnt for ſome time with great violence, inſomuch, that the ſpars and boards whereon the ſaid artificial ſlate lay were in flames, and many of them entirely conſumed by the fire, and ſeveral feet in length of a leaden gutter that lay under, and very near to the roof of the ſaid outhouſe or building was quite melted down by the heat; and this deponent farther ſaith, that from the obſervations he made at the ſaid fire, and from experiments he hath ſince made, he is certain that the ſaid artificial ſlate is not of an inflammable nature, but on the contrary, of a nature to reſiſt fire, and incombuſtible in a certain degree, he the deponent having in particular endeavoured to ſet on flame a piece of the ſaid artificial ſlate, which was perfectly dry at the time, by putting it into the furnace, wherein was a large fire; but as ſoon as it was taken out of the furnace, it ceaſed to flame, and the fire which was in it gradually died out, and ſoon became extinguiſhed of itſelf: and the deponent farther ſaith, that he the ſaid John Addey was ſo well ſatisfied that the ſaid artificial ſlate is not of an inflammable

nature,

nature, or likely to catch fire, and so much approved thereof, that since the said fire happened he had procured more of the artificial slate for the purpose of covering part of a building, although it stood adjacent to a public garden of the aforesaid city, in which garden are frequent exhibitions of fire-works in the Summer.

JOHN DUNNING.

Sworn at the city of Norwich, the day and year aforesaid, before me, JOHN THURLOW, Mayor.